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Particle production cross-sections by 30 GeV protons on Carbon at the NA61/SHINE experiment

This poster presents preliminary results from a fixed target experiment NA61/SHINE (SHINE = SPS Heavy Ion Neutrino Experiment). The NA61 experiment is a continuation of NA49 at CERN SPS which was designed to measure hadron yields from a large range of beam and targets. NA61 detector is a hadron spectrometer which consists of system of Time Projection Chambers (TPCs), Time of Flight detectors (TOF) and Projectile Spectator Detectors (PSD). NA61 has excellent capabilities for momentum,charge and mass measurements. This poster presents performance of the NA61 detector. A long term physics goal of NA61/SHINE experiment is to search for the critical point of strongly interacting matter and study in details the onset of deconfinement [1,2]. The second important goal is to study hadron production needed for neutrino (T2K) and cosmic-ray (Pierre Auger and KASKADE) experiments. This poster is focused on the second subject, it presents measurement of hadron production cross sections from proton-Carbon interactions at 31GeV/c for the T2K experiment at J-PARC [3,4]. For the improvement of the neutrino simulations it is important to have a better knowledge of the pion and kaon production. Three different methods of the pion spectra extractions used in the NA61 experiment are discussed. Finally, preliminary dsigma/dp distributions in several intervals of emission angles of charged pion in p+C interactions at 31GeV/c are shown. The general trend of the distributions is similar to that generated using some recently developed Monte Carlo models.

[1] N.Antoniou et al. [NA49-Collaboration], CERN SPSC-2006-034, (2006).
[2] N.Antoniou et al. [NA61/SHINE Collaboration], CERN SPSC-2007-019, (2007).
[3] T2K Collaboration (Y. Hayato for the collaboration), Nucl.Phys.Proc.Suppl.143: 269-276,2005.
[4] T2K Collaboration (D. Karlen for the collaboration), Nucl.Phys.Proc.Suppl.159: 91-96,2006.

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